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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,601	11/21/2003	Olli-Pekka Pohjola	60279.00073	8207

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EXAMINER	
PAYNE, DAVID C	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/717,601	POHJOLA ET AL.	
	Examiner	Art Unit	
	David C. Payne	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-29 rejected under 35 U.S.C. 102(e) as being anticipated by Smets US 20040013360 A1 (Smets).

Re claims 1, 8, 15, 21, 26, 27, 28, and 29 Smets disclosed,

a reflective splitter is provided that can be implemented in the network architecture shown in FIG. 1 instead of the known splitter 10. FIG. 2 shows an illustrative embodiment of a reflective splitter 11 according to the principles of the invention, where the reflective splitter 11 is arranged to communicate with the optical line terminal 3 via a first communication channel 4. Furthermore, the reflective splitter 11 is arranged to communicate with the eight optical network units 20 via eight second communication channels 30.

Each optical network unit 20 has its own second communication channel 30 to the reflective splitter 11, but inside the reflective splitter 11 all of the incoming channels 30 are coupled in pairs using 2.times.2 couplers 12, known as such to persons skilled in the art. Thus, a first communication channel 30 and a second communication channel 30 are coupled, a third and a fourth are coupled etc. This results in four lines, but the coupling in pairs can be repeated with those four lines until only one first communication channel 4 remains. The last 2.times.2 coupler 12, closest to communication channel 4, has a highly reflective\~12~ mirror 13 connected to the otherwise not used exit port of the 2.times.2 coupler 12. This mirror 13 can for instance be a

gold plated polished connector, but can also be any other suitable \~2~reflector known to a person skilled in the art, such as in fiber reflective fiber Bragg grating. This way an 8.times.1 reflective splitter 11 is formed, but also other possible reflective splitters 11 can be formed, for instance a 4.times.1 or a 16.times.1 reflective splitter 11. An in fiber reflective fiber Bragg grating has the advantage that it can provide a wavelength dependent reflection, e.g., paragraphs 29-30.

4. Claims 1-29 rejected under 35 U.S.C. 102(e) as being anticipated by Chae et al. US 20050078958 A1 (Chae).

Re claims 1, 8, 15, 21, 26, 27, 28, and 29 Chae disclosed,

In FIG. 1, the optical network 10 comprises a plurality of optical network units 12, one of which is shown in more detail in FIG. 1. Each optical network unit 12 comprises an optical transmitter in the form of a light emitting diode (LED) 14. Each optical network unit 12 further comprises a CSMA/CD circuit 16 which is adapted to control the LED transmitter 14. Furthermore, the CSMA/CD circuit 16 is adapted to receive a tapped off optical signal propagating towards the optical network unit 12, which is tapped off by optical tap 18 of the optical network unit 12.

The optical network 10 further comprises an optical star coupler 20 by way of which downstream transmissions on an optical network connection 22 are distributed to the individual optical network units 12 and by way of which upstream transmissions from the individual optical network units 12 are combined onto the optical network connection 22 for transmission to an optical line terminal (not shown). A redirection unit in the form of a fibre Bragg grating 24 is located just after the star coupler 20, in the preferred embodiment within a combiner/distribution unit 26 located e.g. in a kerb side location. In the following, the operation of the optical network 10 to implement an efficient optical CSMA/CD technique for e.g. Ethernet over passive optical network will be described.

The LED transmitter 14 of an individual optical network unit 12 emits light having an optical spectrum A depicted in FIG. 1 toward the star coupler 20. The fibre Bragg grating 24 reflects only a part of spectrum A, and thereby all the optical networks units 12 receive a reflected spectrum B depicted in FIG. 1.

At each optical network unit 12, the optical tab 18 is used to tap off a small portion of power received in a direction towards the optical network units 12 to feed the CSMA/CD circuit 16.

The CSMA/CD circuit 16 can thus effectively sense the presence of an optical signal just after the star coupler 20. If any of the other optical network units 12 transmits at the same time, the optical power to the CSMA/CD circuit 16 will increase due to the overlap of the two packets (frames), i.e. two spectra of the type of spectrum B depicted in FIG. 1. The CSMA/CD circuit 16 detects the change in the received power and based on that change

decides whether a collision has occurred. The CSMA/CD circuit 16 will then notify the LED transmitter 14 to either continue or stop transmission for a later retry, e.g., paragraphs 38-42.

The above described embodiments provide redirection of optical signals just after a remote coupler, e.g. a remote star coupler (compare FIG. 4) through an optical loop-back to e.g. implement optical CSMA/CD protocol for upstream access in Ethernet over passive optical network. The redirected portion of the transmission signal can be a dedicated portion for the redirecting process as opposed to other portions carrying data intended for transmission to the optical line terminal unit, which improves security in avoiding redirecting of someone's data to various network units. A further improvement will now be described, which also relates to the possibility of eavesdropping to another's signal because of the redirecting of the optical signals to various optical network units, e.g., paragraph 55.

Re claims 2-7, 9-14, 16-20, and 22-25 Chae disclosed,

Importantly, it is noted that the optical line terminal (not shown) of the optical network 10 remains passive during this entire process and just receives the spectrum C depicted in FIG. 1 to recover the signal transmitted by a particular optical network unit 12. Accordingly, due to the not-involvement of the optical line terminal, the optical network 10 embodying the present invention can provide the implementation of an efficient optical CSMA/CD technique for Ethernet over passive optical network.

In an alternative embodiment shown in FIG. 2, an optical network 50 comprises a plurality of optical network units 52, one of which is shown in more detail in FIG. 2. Each optical network unit 52 comprises an optical transmitter in the form of a laser transmitter 54. Each optical network unit 52 further comprises a CSMA/CD circuit 56 which is adapted to control the laser transmitter 54. Furthermore, the CSMA/CD circuit 56 is adapted to receive a tapped off optical signal propagating towards the optical network unit 52, which is tapped off by optical tap 58 of the optical network unit 52.

The optical network 50 further comprises an optical star coupler 60 by way of which downstream transmissions on an optical network connection 62 are distributed to the individual optical network units 52 and by way of which upstream transmissions from the individual optical network units 52 are combined onto the optical network connection 62 for transmission to an optical line terminal (not shown). A redirection unit in the form of an optical tap 64, an optical redirecting connection 65, including an optical isolator 66, back to the star coupler 60 is located just after the star coupler 60, in the preferred embodiment within a combiner/distribution unit 76 located e.g. in a kerb side location. In the following, the operation of the optical network 50 to implement an

efficient optical CSMA/CD technique for e.g. Ethernet over passive optical network will be described, e.g., paragraphs 43-45.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Payne whose telephone number is (571) 272-3024. The examiner can normally be reached on M-F, 7:00a - 4:30p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dcp

David C. Payne
Primary Examiner
AU 2613